



ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: D-436-148 F2 BYPASS RATIO: 4.9
 UNIQUE ID NUMBER: 132M004 PRESSURE RATIO (π_{co}): 20.7
 COMBUSTOR: ENGINE TYPE: TF RATED THRUST (F_{oo}) (kN): 68.7

REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO _x	SMOKE NUMBER
D_p/F_{oo} (g/kN) or SN	3.6	48.3	39.3	7.4
AS % OF ORIGINAL LIMIT	18.2	41.0	48.2	28.2
AS % OF CAEP/2 LIMIT (NO _x)			60.3	
AS % OF CAEP/4 LIMIT (NO _x)			69.7	
AS % OF CAEP/6 LIMIT (NO _x)			75.3	
AS % OF CAEP/8 LIMIT (NO _x)			87.0	

DATA STATUS

- PRE-REGULATION
 x CERTIFICATION
 - REVISED (SEE REMARKS)

TEST ENGINE STATUS

x NEWLY MANUFACTURED ENGINES
 x DEDICATED ENGINES TO PRODUCTION STANDARD
 - OTHER (SEE REMARKS)

EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE
 (ANNEX 16 VOLUME II)

CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)
 - OUT OF PRODUCTION (DATE: -)
 - OUT OF SERVICE (DATE: -)

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO _x	
TAKE-OFF	100	0.7	0.581	0.09	0.48	19.76	6.7
CLIMB OUT	85	2.2	0.493	0.05	0.40	16.64	
APPROACH	30	4.0	0.225	0.08	2.71	7.31	
IDLE	7	26.0	0.099	1.39	19.56	3.78	
LTO TOTAL FUEL (kg) or EMISSIONS (g)			274				-
NUMBER OF ENGINES				8	8	8	8
NUMBER OF TESTS				8	8	8	8
AVERAGE D_p/F_{oo} (g/kN) or AVERAGE SN (MAX)				3.3	46.1	38.0	6.9
SIGMA (D_p/F_{oo} in g/kN, or SN)							
RANGE (D_p/F_{oo} in g/kN, or SN)				1.1-7.2	32.5-68.5	34.1-43.3	6.2-8.2

ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT - POWER SETTINGS
 STAGE BLEED 0 (% CORE FLOW) AT - POWER SETTINGS

ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	99-102.7
TEMPERATURE (K)	266-301
ABS HUMIDITY (kg/kg)	0.00248-0.01624

FUEL

SPEC	RT
H/C	1.92
AROM (%)	13.3-19.7

MANUFACTURER: IVCHENKO PROGRESS ZMBK
 TEST ORGANIZATION: IVCHENKO PROGRESS ZMBK
 TEST LOCATION: ZAPOROJE
 TEST DATES: 27/12/1991-28/07/2006

NO_x REGULATION PARAGRAPH

x	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
	2.3.2 e) (CAEP/8)

REMARKS

1. NO_x levels in accordance with Part III, Chapter 2, 2.3.2 c) (CAEP/4)

Compliance with Fuel Venting requirements:

x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)